TMDL SUMMARY

E. coli Bacteria TMDLs for the Wild Rice River & Tributaries
Sargent and Ransom Counties, North Dakota

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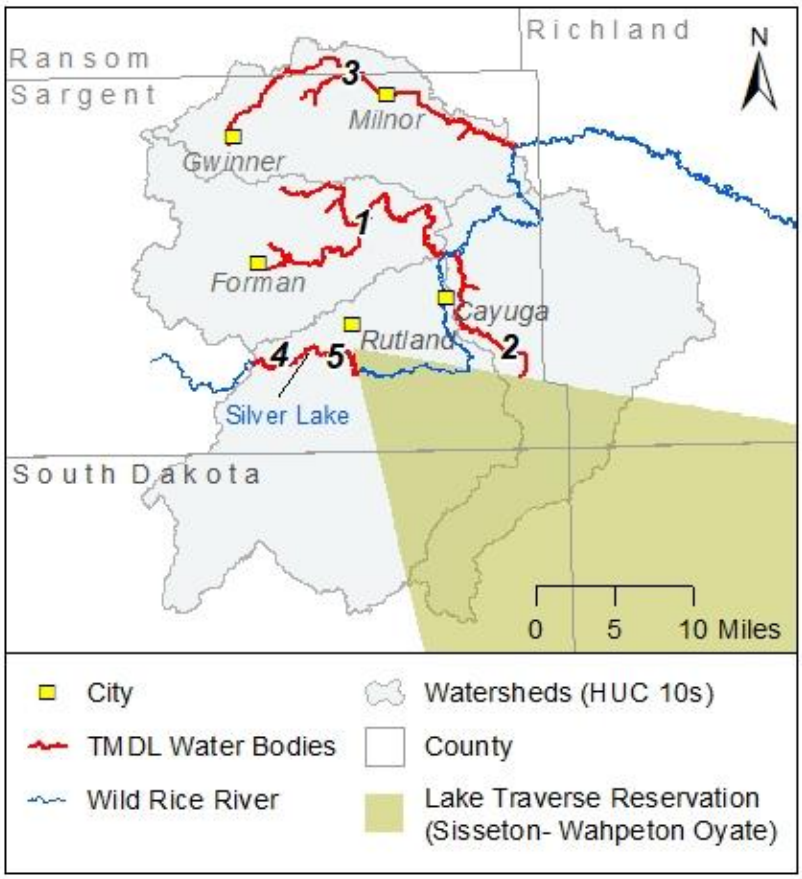
The federal Clean Water Act is a set of rules and programs helping states prevent and reduce water pollution. To support this goal, states must identify polluted waters and plan to restore their health. Part of this plan is developing a Total Maximum Daily Load (TMDL). A TMDL is the amount of a pollutant a water body can handle and still meet the state water quality standards.

Developing a TMDL is like writing a prescription for a water body - it determines how much of a pollutant is present, where it's coming from, and how it can be reduced to meet standards and restore water quality. Water quality standards protect the assigned uses of water bodies, such as drinking water or recreation. Water bodies not meeting water quality standards require a TMDL.

Wild Rice River and tributaries

This is a summary of the TMDL document for *Escherichia coli (E. coli)* bacteria in the Wild Rice River and tributaries in southeastern North Dakota. The document develops TMDLs for five water bodies in Ransom and Sargent Counties that are not supporting recreation use due to high levels of *E. coli*. *E. coli* bacteria is common in human and animal digestive systems. As a result, *E. coli* in water suggests that sewage or animal waste is present. Water with high levels of *E. coli* can make people and animals sick and is unsafe to swim or recreate in.

The TMDL document is a tool to help restore the health of each water body and meet water quality standards. The five water bodies that TMDLs were developed for include:



1. Crooked Creek watershed to its confluence with the Wild Rice River (41 miles of stream).

2. Shortfoot Creek from its confluence with the Wild Rice River upstream to the reservation boundary, including all tributaries (18 miles of stream).

3. Unnamed tributary to the Wild Rice River located near Milnor in northeast Sargent County (39 miles of stream).

4. Wild Rice River from its confluence with Wild Rice Creek downstream to its confluence with Silver Lake (6 miles of stream).

5. Wild Rice River from its confluence with Silver Lake downstream to the reservation boundary (9 miles of stream).

HOW MUCH IS TOO MUCH?

North Dakota water quality standards for *E. coli* apply May 1 to Sept. 30. Surface waters in the state are required to meet *E. coli* standards so that the public can safely use waters for recreation. Standards protect primary recreation (swimming or bathing for example) and secondary recreation (wading or fishing for example) activities.

Standards have two conditions that BOTH apply to the amount of *E. coli* in surface water:

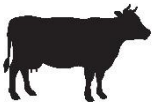
1. The monthly geometric mean of samples must be less than or equal to 126 CFU/100mL
2. No more than 10 percent of samples in a month can be greater than 409 CFU/100mL

E. coli bacteria is measured as colony forming units (CFU) in one-hundred milliliters (mL) of water. All five TMDL water bodies addressed in this document have *E. coli* levels higher than the standards. As a result, they are not meeting water quality standards and are not supporting recreation use.

WHERE IS IT COMING FROM?

High levels of *E. coli* bacteria are likely from more than one source:

Nearly half of the TMDL watershed area is used for crop production and another large part is open water and wetlands. In areas where manure is applied to cropland, *E. coli* can travel into streams, especially during rain events, snowmelt, and flooding. In addition, almost none of the area near water bodies is covered by trees or shrubs, which can buffer and help protect streams from *E. coli* in runoff.



Livestock grazing near water bodies in grasslands and pastures can add *E. coli* directly where livestock are in streams or through runoff.

Farms and isolated houses in the area likely use individual septic systems to treat household waste. If septic systems leak or fail, they can add *E. coli* to the watershed.

One water body, the Wild Rice River, flows through a national wildlife refuge. Each year, the hundreds of thousands of birds and other wildlife visiting the refuge and the surrounding area can add *E. coli* to the watershed.

Wastewater treatment facilities in the area are small lagoons permitted to discharge treated wastewater to surface water. Lagoons in this area rarely discharge (usually less than two times each year), but can also add *E. coli*.

<u>*E. coli* in the Crooked Creek Watershed</u>

Forman has a small lagoon system permitted to discharge treated wastewater to Crooked Creek. Forman rarely discharges, but could be adding *E. coli* to the watershed. High levels of *E. coli* are likely coming from runoff sources. More than half of the watershed area is cropland. Manure applied to cropland could add large amounts of *E. coli* carried into streams with rain and snowmelt. The amount of *E. coli* in the watershed needs to be reduced by up to 83% to meet water quality standards.

<u>*E. coli* in Shortfoot Creek</u>

Cayuga has a small lagoon system permitted to discharge treated wastewater to Shortfoot Creek. Cayuga has not discharged in over 30 years, so it is not adding *E. coli*. High levels of *E. coli* are likely coming from runoff sources. More than half of the watershed area is cropland. Manure applied to cropland could add large amounts of *E. coli* carried into streams with rain and snowmelt. The amount of *E. coli* in the water body needs to be reduced by up to 81% to meet water quality standards.

<u>*E. coli* in unnamed tributary to the Wild Rice River</u>

Gwinner and Milnor have small lagoon systems permitted to discharge treated wastewater to an unnamed tributary to the Wild Rice River. The lagoons usually discharge once every spring (and again after the recreation season ends) and could add *E. coli* to the water body. High levels of *E. coli* are likely coming from runoff sources. More than half of the watershed area is cropland. Manure applied to cropland could add large amounts of *E. coli* carried into streams with rain and snowmelt. The amount of *E. coli* in the water body needs to be reduced by up to 74% to meet water quality standards.

<u>*E. coli* in the Wild Rice River (two sections)</u>

Rutland has a small lagoon system permitted to discharge treated wastewater to a drainage ditch that flows into the Wild Rice River. Rutland rarely discharges but could add *E. coli* to the water body. High levels of *E. coli* are likely coming from runoff sources. About one third of the watershed area is cropland, and one-quarter of the watershed is grassland and pasture. Manure applied to cropland and grazing in grasslands and pasture could add *E. coli* carried into streams with rain and snowmelt. A large amount of *E. coli* may be coming from the large number of birds that visit the nearby national wildlife refuge in the spring and fall. The amount of *E. coli* in the water bodies needs to be reduced by up to 79% to meet the target TMDL and support water quality standards.

WHAT CAN WE DO ABOUT IT?

Wastewater treatment facilities with potential to add *E. coli* will have *E. coli* limits added to their discharge permits (during the recreation season, May 1 to Sept. 30).

Runoff sources that add *E. coli* do not have permits with water quality limits. Instead, reducing *E. coli* from rain or snowmelt runoff relies on voluntary actions of landowners and residents in the watershed. Landowners can do their part with Best Management Practices (BMPs). BMPs are tested, cost-effective methods that help control pollution and support water quality.

Some of the BMPs that could help reduce the amount of *E. coli* reaching the water bodies include:

- Vegetation barriers/buffers
- Cover crops
- Nutrient management planning
- Drainage water management
- Livestock access control
- Waste storage facilities

Other actions that can help:

- An area-wide study of septic systems
- An *E. coli* source tracking study
- Local demos and workshops on watershed practices

MAKING IT HAPPEN

The TMDL document can be used to help direct efforts and actions to areas and sources that make the most impact to reduce *E. coli* in the water bodies. Restoring water quality in the Wild Rice River and tributaries depends almost entirely on local support. Progress has been made over many years and continues thanks to landowners, residents, and the Wild Rice Soil Conservation District.

Soil Conservation Districts (SCDs) coordinate community conservation efforts. Each districts operates under a locally elected board and works directly with landowners to tackle local resource concerns, such as water quality. In 2022 the Wild Rice Soil Conservation District started a new project expected to cover 10 years. Phase 1 of the project focuses on watershed areas with high levels of nutrients and sediments. Although phase 1 of the project does not specifically focus on *E. coli*, many Best Management Practices that reduce nutrients and sediments can also reduce *E. coli*. The TMDL document recommends continuing *E. coli* sampling on the five TMDL water bodies and expanding sampling in areas where more data is needed to understand sources. Additional sampling will measure progress and help adjust planning to meet water quality standards.

Individuals and organizations interested in learning more should contact the North Dakota Department of Environmental Quality (NDDEQ) or the Wild Rice Soil Conservation District:

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